

Old US-131 Bridge
Spanning the Muskegon River
Mecosta Township *Vic.*
Mecosta County
Michigan

HAER No. MI-113

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Midwest Field Office
Great Lakes Systems Office
1709 Jackson Street
Omaha, Nebraska 68102-2571

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**HISTORIC AMERICAN ENGINEERING RECORD
OLD US-131 BRIDGE OVER THE MUSKEGON RIVER
MECOSTA COUNTY, MICHIGAN**

HAER No MI-113

I. INTRODUCTION

Location: Located on Old US-131, 6.5 miles south of Big Rapids, Mecosta ^{Village} Township, Mecosta County, Michigan. The bridge spans the Muskegon River just below Roger's Dam.

USGS Quad: Stanwood, Michigan (Revised 1985)

UTM: Zone: 16 North End South End
Easting: 622640 622610
Northing: 4829300 4829160

Date of Construction: Contract Date: May 9, 1929
Completion Date: August 1, 1930

Present Owner: State of Michigan
Michigan Department of Transportation
Lansing, Michigan

Present Use: Two-lane vehicular and pedestrian bridge to be replaced by a new vehicular and pedestrian bridge.

Significance: The bridge was constructed using standardized bridge plans developed by the Michigan State Highway Department. The bridge's 4 spans make it one the longest surviving steel multi-girder bridges still retaining its original concrete balustrade.

Historian: Irene Jackson Henry and William Henry, Henry & Henry Preservation and Architectural Consultants, July 1996.

I. PROJECT BACKGROUND

The Michigan Department of Transportation (MDOT) plans to replace the Old US-131 bridge over the Muskegon River, Mecosta Township, Mecosta County, Michigan. The Michigan Historical Center has determined that the bridge is eligible for listing in the National Register of Historic Places. According to a MDOT structure inventory "the bridge is the longest (by nearly 100 feet) of only thirteen examples of the steel, multi-stringer, plate girder, non-composite type retaining original concrete railings." [1]

The bridge was built in 1929 as part of the Federal Aid Bridge Program. The Old US-131 bridge served the neighboring community and travelling public with a modern and safe means to cross the Muskegon River. Over the years the bridge has decayed and is no longer suited for modern transportation needs. Recent bridge inspections conducted by MDOT have determined that the bridge suffers from extensive deterioration. Bridge inspection reports reveal that the bridge suffers from severe rusting and deterioration of the steel beams and cross frames. [2] Traffic studies also indicated the bridge is no longer sufficient to handle the present and projected traffic volumes. MDOT plans to replace the bridge in 1997. Prior to demolition of the existing span, MDOT is required to conduct detailed studies on a number of issues. Among these issues are environmental and historical concerns.

The Michigan Department of State, Michigan Historical Center, determined that the Old US-131 bridge over Muskegon River, is historically significant and is eligible for

inclusion in the National Register of Historic Places. Part of the determination required a Memorandum of Agreement to be negotiated between the Federal Highway Administration and Michigan State Historic Preservation Office, prior to the removal and replacement of the Old US-131 bridge. Under the terms of the agreement the Michigan SHPO will document and record the bridge according to standards determined by the Historic American Engineering Record. This record will provide a permanent record of the bridge's existence.

II. HISTORICAL INFORMATION

The Old US-131 highway bridge crossing the Muskegon River near the village of Stanwood is part of a major artery connecting Big Rapids with Grand Rapids, fifty miles to the south.

Prior to 1929, plans were being developed to construct a modern highway bridge across the Muskegon River. The bridge was designated a Federal Aid Bridge and construction of the bridge was done under the Federal Aid Bridge Program. In 1916, Congress passed the Federal Road Aid Act. Under this legislation the Federal Government allocated \$75 million dollars in matching funds to individual states for road and bridge construction. In 1917, Michigan began participation in the program. In 1919, Michigan voters appropriated an additional \$50 million for road improvements and new construction.

The bridge was designed using standardized plans developed in the 1920's by the Bridge

Division, Michigan State Highway Department. Prior to 1913, the MSHD had limited direct involvement in bridge construction. Bridge construction was handled at the local county level with MSHD officials acting as consultants when requested. The passage of the State Trunk Line Act (1913) transferred responsibility to the State to construct and maintain all trunk line roads. The State Reward Act (1919) required the highway department to assume half the cost, and to supervise construction on all bridges on state reward roads. [3] Soon after the passage, in 1913, of the State Trunk Line Act, the highway department established the Bridge Division with C.V. Dewart as its first director. Soon afterwards Dewart began developing standardized bridge plans, these first plans consisted of concrete girder bridges. These bridges were designed to be constructed by local contractors, using unskilled labor with locally available materials. Plans for 30, 35 and 40 foot spans were initially developed and 45 and 50 foot spans were added in 1916. These bridges were often referred to as "Dewart's Tunnels."

Dewart was succeeded by C.A. Melick who became the state's second bridge engineer. It was under Melick's tenure that the Old US-131 bridge was constructed. Melick was a proponent of continuing development of standardized bridge plans, writing numerous articles on the subject in professional journals. Melick quickly recognized the necessity and economic benefits of standardized construction.

"Were time and means available, there would no doubt be as great a variety of types of structures as the conditions would warrant. Indeed, if the smaller political units directly controlling highway structures, were to handle the design

of all these structures, the types and variety of treatments adopted would far exceed the number for which there might be any legitimate need. On the other hand, whenever the responsibility for design of a large and varied group of structures is suddenly turned over to one organization to handle, the "economic necessity" arising from the provision of a small and undeveloped organization for handling of such a large problem will bring about the exercise of a great deal of ingenuity in the endeavor to reduce the number of types to a minimum and further, for each type, to provide designs which may, in their scope, take care of the greatest range of conditions. This soon leads to the provision of the so-called "standardized plan" showing a general drawing with a key marking system referring to tables which enable the drawing of "standard plan" to be applied to quite a range of conditions. [4]

Using the standardized plans developed, the MSHD's bridge division the project was first advertised on April 16, 1929. Several days later a detailed description of the project appeared in the April 18, 1929 edition of Michigan Roads and Pavements:

"Sealed bids will be received ...for the construction of a bridge located on US 131. The substructure consists of two reinforced concrete abutments of the counterfort type of 23 ft. 6 in. from the bottom of the footings to crown of roadway and three reinforced concrete piers of the gravity type with a height of 24 ft. 6 in. from bottom of footing to crown of roadway and is on a 90 degree angle of crossing, The superstructure is of the steel deck girder type (Fabricated

Sections) with reinforced concrete floor, concrete wearing surface, concrete railing and consists of four 70 ft. spans with a 30 ft. roadway. [5]

Construction bids were solicited for the construction of the bridge and were received on May 9, 1929. [6] On May 21, 1929 two separate contracts were awarded; the first to the Massillon Bridge and Structural Company of Massillon, Ohio for \$ 16,270.66. The second contract was let to the Joliet Bridge and Construction Company of Joliet, Illinois, for \$54,262.71. The total project contract amounted to \$70,533.37, with the State providing \$35,161.37 in funds and the Federal Government providing \$35,372.00. [7] Under the contract, the Massillon Bridge and Structural Company provided the pre-fabricated steel spans, and the Joliet Bridge and Construction Company assumed responsibility for the erection and completion of the entire bridge. By late May 1929, the Joliet Company had begun preliminary site work and construction of the substructure. This was completed in early October, 1929. Meanwhile, the Massillon Company had begun fabrication of the structural steel. The spans were delivered to the site on August 14, 1929. Erection of the spans was quickly underway and was completed on October 30, 1929. The Joliet Company continued to work on the superstructure, which was completed in late July 1930. Supervising construction was resident engineer H. T. Fleming. Project engineers included R.L. Doyle and H.G. Rose. The bridge was completed in the late summer of 1930 and accepted by Michigan State Highway Department in 1931. [8]

III. OLD US-131 BRIDGE

A. DESCRIPTION

The Old US-131 bridge is constructed of reinforced concrete with four spans supported by three solid concrete counterfort piers. At the north and south approaches are reinforced concrete abutments. The four bridge spans measure 85.12 meters (280 feet) in length and 9.12 meters (30 feet) in width. Narrow concrete walkways are located on either side of the roadway and extend the length of the bridge. Each of the four spans measures 21.28 meters (70 feet). The north and south concrete approach abutments are 4.71 meters (15.5 feet) in length. The total length of the bridge including the two end abutments is 94.54 meters (311 feet).

The bridge deck is supported by nine rows of concrete tee-beams, consisting of rolled steel I-beams encased in concrete creating stringers that run the length of the bridge. Non-structural concrete beams extend the length of the bridge below the concrete railing giving the impression that the bridge is all concrete in construction. Decorative architectural detailing is limited. The only major decorative elements are the concrete guardrails which are supported by reinforced concrete fluted columns. The balustrades are interrupted by evenly spaced concrete piers. The concrete piers have recessed panels on each side. Located on the top of the end pier at the southeast corner is the original bronze MSHD plaque. The plaque had the following inscription:

FEDERAL AID BRIDGE
No B1 of 54-12-1 1929
BUILT JOINTLY BY
FEDERAL GOVERNMENT
STATE HIGHWAY COMMISSION
UNDER THE SUPERVISION OF
GROVER C. DILLMAN - STATE HIGHWAY COMMR.
CONTRACTOR - JOLIET BRIDGE & CONST. CO.

Stamped in the northeast corner of the plaque was the bridge identification number: BO 2-54011.

B. MODIFICATIONS

The bridge has been generally unaltered since its construction in 1931. The bridge is in a deteriorated condition with holes visible through the deck. Concrete spalling is common with portions of the railings, piers and balustrades missing.

A review of MDOT files for early maintenance records on the bridge was unsuccessful. Many of these files were destroyed in the Cass Building fire, which housed the Michigan State Highway Department, in February, 1951. [9] In 1987, internal MDOT correspondence indicated that the bridge was beginning to show structural flaws and that it should be considered for replacement. [10] The bridge was repaired on several occasions but after recent bridge inspections in 1995 was designated for replacement in 1996. [11]

C. OWNERSHIP AND FUTURE PLANS

The bridge was designated at Federal Aid Bridge when it was originally constructed in 1929. The bridge is currently owned by the State of Michigan, and is under the authority of the Michigan Department of Transportation, in Lansing, Michigan. Current plans call for MDOT to turn over the ownership of Old US-131 to Mecosta County. [12] According to the Environmental Assessment the bridge is in need of replacement due to extensive deterioration.

"Inspections have revealed that the beams and cross frames are severely rusted, the under side of the deck has numerous map (multiple random surface cracks) and heavy leaching cracks, girders have rusted extensively, all bearings are rusted, the piers have severe scale above the water line, and the railings have severe scale with reinforcing steel exposed. Failure to do the proposed project may lead to structural failure and permanent closure of the bridge." [13]

Current plans call for the bridge construction contract to be let in the fourth quarter of 1996, depending on availability of funds. Work would begin in the next year, and it is estimated that it would take one full construction season to complete the replacement on the bridge. [14]

IV. FOOTNOTES

1. Michigan Department of Transportation. Environmental Assessment, Programmatic Section 4(F) Evaluation for the Proposed Replacement of the Bridge on Old US-131 Over the Muskegon River in Mecosta Township, Mecosta County, MI: 29.
2. Ibid., 1.
3. Hyde, Charles K. Historic Highway Bridges of Michigan. Detroit: Wayne State University Press, 1993: 36-37.
4. Melick, C.V. "Standard Bridge Practice of the Michigan State Highway Department," Concrete 23. 1923: 3-10.
5. Michigan Roads and Pavements. April 18, 1929: 20.
6. Fleming, H.T., Resident Engineer. "Construction History and Diary [Old US-131 Bridge over the Muskegon River, Mecosta County, Michigan]."
7. Michigan State Highway Department, Thirteenth Biennial Report 1929-1930: 192.
8. Fleming, H.T., Resident Engineer. "Construction History and Diary [Old US-131 Bridge over the Muskegon River, Mecosta County, Michigan]."
9. LeRoy Barnett, State Reference Archivist. Personal Interview; July 12, 1996.
10. Michigan Department of Transportation (Bridge Division File (B)2-54011). Memorandum: Keith Bushnell, Engineer of Design to Maurice E. Witteveen, Engineer of Maintenance. September 1, 1987.
11. Michigan Department of Transportation (Bridge Division File (B)2-54011). Memorandum: Larry R. Brown, District 5 Engineer to C.J. Arnold, Engineer of Design. December 1, 1995.
12. Michigan Department of Transportation. Environmental Assessment, Programmatic Section 4(F) Evaluation for the Proposed Replacement of the Bridge on Old US-131 Over the Muskegon River in Mecosta Township, Mecosta County, MI: 1.
13. Ibid., 1.
14. Ibid., 5.

V. BIBLIOGRAPHY

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Jackson, Donald C. Great American Bridges and Dams. Washington, D.C., 1988.

B. GOVERNMENT DOCUMENTS

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Michigan State Highway Department. Twelfth Biennial Report, 1927-1928. Lansing, 1929.

Michigan State Highway Department. Thirteenth Biennial Report, 1929-1930. Lansing, 1931.

Michigan State Highway Department. Fourteenth Biennial Report, 1931-1932. Lansing, 1932.

Michigan State Highway Department. Fifteenth Biennial Report, 1933-1934. Lansing, 1934.

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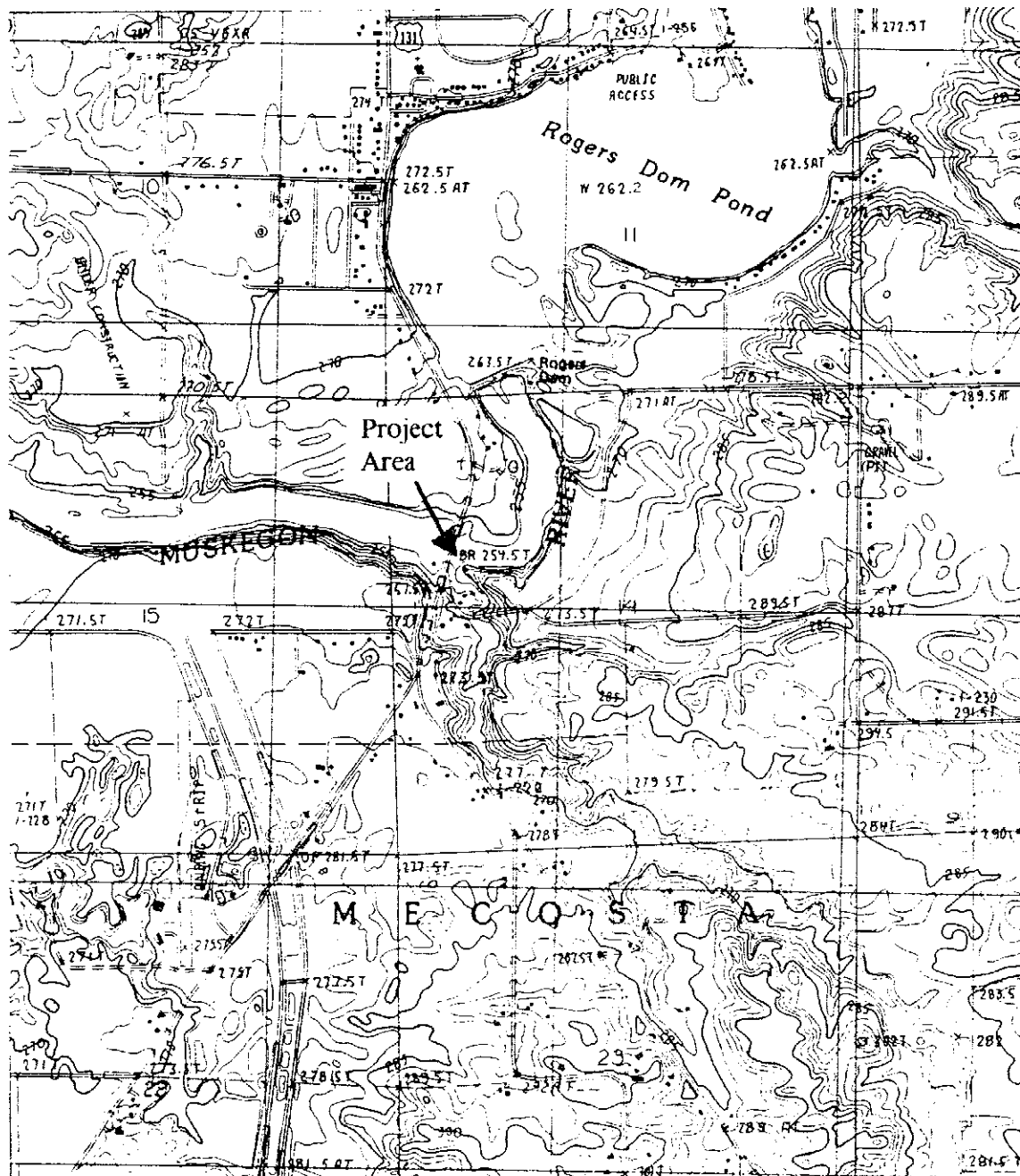
C. PERIODICALS

Melick, C.V. "Standard Bridge Practice of the Michigan State Highway Department." Concrete 23. 1923.

Michigan Roads and Airports. Lansing, June 29, 1933.

Michigan Roads and Pavements. Lansing, April 18, 1929.

Michigan Roads and Pavements. Lansing, May 23, 1929.



LOCATION MAP

Old US-131 Bridge Over Muskegon River, Mecosta County, Michigan
(Source: USGS Topographic Map, Stanwood, MI Quadrangle, 1985)